1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name**  Dissolvine® NA2-S

**Chemical Name**  Ethylenediaminetetraacetic acid, disodium salt, dihydrate

**Synonym(s)**  Disodium EDTA dihydrate

**Product Use**  Chelating agent

**Manufacturer / Supplier**  Akzo Nobel Functional Chemicals LLC
Chelates Americas
525 West Van Buren St., Chicago, IL  60607
Tel. 1-800-906-7979
www.dissolvine.com

**Emergency Telephone Numbers**

**CHEMICAL**  CHEMTREC  (800) 424-9300 (Toll-free in the U.S., Canada, and the U.S. Virgin Islands)
**EMERGENCY**  (24-hr)  (703) 527-3887 (For calls originating elsewhere / collect calls are accepted)
**(Spill, Leak, Fire, Exposure or Accident)**  CANUTEC  (Canada)

**MEDICAL / HANDLING EMERGENCIES**  (914) 693-6946 [AkzoNobel – USA]

2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th><strong>EMERGENCY OVERVIEW</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAUTION !</strong>  Contact with dust may cause skin, eye and respiratory tract irritation.</td>
</tr>
<tr>
<td><strong>Appearance and odor</strong>  Odorless white free-flowing powder.</td>
</tr>
<tr>
<td><strong>Fire &amp; Explosion Hazards</strong>  Although this product is not defined as flammable or combustible, potential for dust explosion may exist. Depending upon conditions, dust may be sensitive to static discharge. Avoid possibility of dry powder and friction causing static electricity in presence of flammable materials (See NFPA-77, Chap.6).</td>
</tr>
</tbody>
</table>

**POTENTIAL HEALTH EFFECTS**  [See Section 11 for additional information]

**Primary Route(s) of Exposure**  Eye contact, skin contact and inhalation

**Acute Exposure**

**Inhalation**  Exposure to an excessive concentration of dust may cause respiratory tract discomfort and/or mild irritation.

**Skin Contact**  Disodium EDTA dihydrate was moderately irritating to rabbit skin, causing reversible effects such as redness, slight edema, scabbing and scarring after repeated application.

**Eye Contact**  Eye contact with dust may cause mild physical irritation.

**Ingestion**  This product is expected to have a low order of acute toxicity.

**Carcinogenicity**  IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen.

**Reproduction**  EDTA and its sodium salts caused birth defects in some animal studies in the presence of maternal toxicity

**Medical Conditions Aggravated by Exposure**  There are no data available that address medical conditions that are generally recognized as being aggravated by exposure to this product.
2. HAZARDS IDENTIFICATION (CONTINUED)

POTENTIAL ENVIRONMENTAL EFFECTS [See Section 12 for additional information]

Aquatic Toxicity  This product is not expected to be harmful to aquatic life, based on available data.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>CAS Number</th>
<th>% (w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA disodium salt</td>
<td>139-33-3</td>
<td>89 – 91</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>9 – 11</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Inhalation**: Dust may be irritating to the respiratory tract and cause symptoms of bronchitis. Remove victim to fresh air. If irritation occurs or if breathing becomes difficult, get medical attention.

**Skin Contact**: Remove contaminated clothing, shoes and equipment. Wash all affected areas with soap and plenty of water. Wash contaminated clothing and shoes before reuse. Get medical attention if irritation occurs or persists.

**Eye Contact**: Flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Do not let victim rub eye(s). Do not attempt to neutralize with chemical agents. Get medical attention if eye irritation occurs.

**Ingestion**: Give several glasses of water. DO NOT induce vomiting. If vomiting occurs, keep head below hips to reduce risk of aspiration. Give fluids again. Never give anything by mouth to a person who is unconscious or convulsing. Get medical attention if health effects occur.

**Note to Physician**: Attending physician should treat exposed patients symptomatically.

5. FIRE FIGHTING MEASURES

**Flammable Properties**: not flammable or combustible

**Extinguishing Media**: Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.

**Fire Fighting Procedures**: As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate all non-essential personnel from the fire area. Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing.

**Fire & Explosion Hazards**: Although this product is not defined as flammable or combustible, potential for dust explosion may exist. Depending upon conditions, dust may be sensitive to static discharge. Avoid possibility of dry powder and friction causing static electricity in presence of flammable materials (See NFPA-77, Chap.6).

**Hazardous Combustion Products**: Thermal decomposition products may release toxic and/or hazardous fumes and gases, including nitrogen oxides and carbon oxides.

**NFPA Hazard Rating**

- Health: 1
- Fire: 1
- Instability: 0
- Other: None

[0 – Minimal  /  1 – Slight  /  2 – Moderate  /  3 – High  /  4 – Extreme]

6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions**: All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment.

**Methods for Containment**: Safely stop source of spill. Restrict non-essential personnel from area.
6. ACCIDENTAL RELEASE MEASURES

**Environmental Precautions**
Sweep up spilled solid material, being careful not to create dust. Return sweepings to stock or, if contaminated, place into a chemical waste container for disposal. Flush remainder with water.

**Methods for Clean-up**
Using a stiff brush, work the slurry into cracks and crevices. Allow to stand for 2-3 minutes. Then flush again with water. Repeat if necessary. Dike water for later disposal. Do not allow contaminated water to enter waterways. CAUTION – The spill area may be slippery.

**Other Information**
See also Section 13 for disposal information.

7. HANDLING AND STORAGE

**Handling**
Avoid inhalation of dust as well as prolonged and/or repeated skin and eye contact.

**Storage**
Keep containers closed and dry. This material is suitable for any general chemical storage area. Store in PVC, PE, stainless steel or bituminized tanks. Avoid contact with aluminum, copper, copper alloys, nickel and zinc.

**Recommended Storage Temperature**
Store in a cool and dry place at ambient temperature (below 25°C / 77°F).

**General Comments**
Containers should not be opened until ready for use. Opened containers must be closed again properly. It is advised to re-test the product after three years of storage. In certain concentrations, the product may form an explosive dust-air mixture. Protect product from moisture and wet air.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>OSHA – PELs (mg / m³)</th>
<th>ACGIH – TLVs (mg / m³)</th>
<th>NIOSH – RELs (mg / m³)</th>
<th>AIHA – WEELs (mg / m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA</td>
<td>STEL / CEIL(C)</td>
<td>TWA</td>
<td>STEL / CEIL(C)</td>
</tr>
<tr>
<td>EDTA, disodium salt</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
</tr>
<tr>
<td>Water</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
<td>N/D</td>
</tr>
</tbody>
</table>


**Legend:**
CEIL: Ceiling Exposure Limit  PEL: Permissible Exposure Limit  REL: Recommended Exposure Limit  STEL: Short Term Exposure Limit  TLV: Threshold Limit Value  TWA: Time-Weighted Average  N/D: Not Determined  WEEL: Workplace Environmental Exposure Level

**Engineering Controls & Ventilation**
Special ventilation is usually not required under normal use conditions. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of dust in the air.

**Personal Protective Equipment (PPE)**

**Respiratory**
Use of respiratory protection is generally not required. However, if use conditions generate dust and adequate ventilation (e.g., outdoor or well-ventilated area) is not available, use a NIOSH-approved organic vapor respirator with dust, mist and fume filters to reduce potential for inhalation exposure. When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the work shift) to assure breakthrough exposure does not occur.
8. EXPOSURE CONTROLS / PERSONAL PROTECTION (CONTINUED)

Skin
Skin contact with the product should be minimized or prevented through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential. For permanent (>8 hours) full contact use, 100% Viton gloves are recommended.

Eyes/Face
Since eye contact with dust may cause irritation, chemical goggles and/or a face shield should be worn when handling this product.

Hygiene Measures
All food and smoking materials should be kept in a separate area away from the storage/use location. Eating, drinking and smoking should be prohibited in areas where there is a potential for significant exposure to this material. Before eating, drinking and smoking, hands and face should be thoroughly washed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form: powder
Color: white
Odor: odorless

Boiling Point: not applicable
Bulk Density: ~ 700 kg/m³
Evaporation Rate (Butyl Acetate=1): not determined
Melting Point: 110°C (230°F) / loss of crystallization
Odor Threshold: not determined
pH: ~ 4.0 – 6.0 (5% solution)
Partition Coefficient (n-octanol/water): Log P_{ow} < 0
Solubility in Water: ~ 100 mg/L (at 20°C / 68°F)
Solubility in Other Solvents: not determined
Specific Gravity: not determined
Vapor Density (Air = 1): not applicable
Vapor Pressure: not applicable
Viscosity: not applicable
Volatile (% by weight): not determined
Other: decomposition temperature = 255°C (491°F)
Flammability: not flammable or combustible
Flash Point (Method): not applicable
Upper Flammable Limit (% by volume): not applicable
Lower Flammable Limit (% by volume): not applicable
Auto-Ignition Temperature: not applicable

< : less than  > : greater than  ≈ : approximately

10. STABILITY AND REACTIVITY

Chemical Stability
This product is stable under recommended storage and handling conditions (see section 7). It is not self-reactive and is not sensitive to physical impact.

Conditions to Avoid
Avoid contact with aluminum, nickel, zinc, copper and copper alloys in combination with humidity/water (formation of hydrogen). Avoid prolonged storage at elevated temperatures.

Incompatible Materials
This product is incompatible with strong oxidizers.
10. STABILITY AND REACTIVITY (CONTINUED)

**Hazardous Decomposition Products**
Under fire conditions the product may support combustion and decomposes to give off carbon oxides fumes (CO, CO₂) and nitrogen oxides.

**Possibility of Hazardous Reactions**
Hazardous polymerization is not expected to occur under normal temperatures and pressures.

11. TOXICOLOGICAL INFORMATION

**Inhalation - Acute**
The acute LC₅₀ for this product is not available. There were no mortalities when rats were exposed to a saturated dust atmosphere (nominal concentration of 1.13 mg/L) for 7 hours.
Exposure to an excessive concentration of dust may cause respiratory tract discomfort and/or mild irritation.

**Inhalation - Chronic**
No known effects for this product.

**Skin - Acute**
Dermal toxicity for this product is not available. A 4-hour human exposure to 0.2 g of 99% pure Disodium EDTA showed no irritation. Disodium EDTA dihydrate was moderately irritating to rabbit skin causing reversible effects such as redness, slight edema, scabbing and scarring after repeated application.

**Skin - Chronic**
No known effects for this product.

**Eyes**
This product is slightly irritating to rabbit eyes.

**Ingestion - Acute**
The oral LD₅₀ is greater than 2,000 mg/kg (rat).

**Ingestion - Chronic**
Disodium EDTA was administered in the feed of male rats for 4 weeks and female rats for 31 days. There were no adverse effects at the lowest tested dose of 692 mg/kg/day for male rats and 237 mg/kg/day for female rats (NOAEL). As well, in a 2-year study, rats were fed diets containing 0.5, 1 or 5% Disodium EDTA. There were no mortalities attributed to the treatment.

**Sensitization**
No known effects for this product.

**Carcinogenicity**
IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen.

**Mutagenicity**
Disodium EDTA dihydrate gave negative results in numerous tests (such as Ames Assay, Mouse Lymphoma Assay, Micronucleus Assay). Disodium EDTA dihydrate did induce a dose-dependent increase in chromosome aberrations in CHL fibroblast cells with metabolic activation.

**Reproductive Toxicity**
EDTA and its sodium salts have been reported, in some studies, to cause birth defects in laboratory animals only at exaggerated doses that were toxic to the mother. These effects are likely associated with zinc deficiency due to chelation. Exposures having no effect on the mother should have no effect on the fetus. Disodium EDTA had no effect on mouse sperm morphology.

**Other Effects**
None known.

**Target Organs**
Eyes, skin and developmental (in the presence of maternal toxicity).

12. ECOLOGICAL INFORMATION

**Ecotoxicity**
No data available for this product. However, the following information is available for a structurally related product:

<table>
<thead>
<tr>
<th>Test</th>
<th>Exposure / Duration</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algae (green algae)</td>
<td>96-h</td>
<td>EC₅₀ = 1.14E8 mg/L (calculated by EPIWIN model)</td>
</tr>
<tr>
<td>Fish (guppy)</td>
<td>96-h</td>
<td>LC₅₀ = 320 mg/L</td>
</tr>
<tr>
<td>Bacteria (Pseudomonas putida)</td>
<td>8-h</td>
<td>EC₅₀ = 56 mg/L</td>
</tr>
</tbody>
</table>
12. ECOLOGICAL INFORMATION (CONTINUED)

**Biodegradation**
This product is not readily biodegradable (based on tests with structurally related products).

**Bioaccumulation**
It is not expected to bioaccumulate. The calculated Log Pow is – 11.7 (EPIWIN/KOWWIN models).

**Other Ecotoxicity information**
Disodium EDTA did not undergo photodegradation under laboratory conditions.

13. DISPOSAL CONSIDERATIONS

**Waste Disposal**
In its unused condition, this product is not considered to be a RCRA-defined hazardous waste by characteristics or listings. It is the responsibility of the waste generator to evaluate whether his wastes are hazardous by characteristic or listing. Dispose in accordance with all local, state and federal regulations. NOTE – State and local regulations may be more stringent than federal regulations.

**Container Disposal**
Containers should be cleaned of residual product before disposal or return. Since emptied containers retain product residue, follow label warnings even after container is emptied. Empty containers should be disposed of or shipped in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>Regulatory Information</th>
<th>UN Number</th>
<th>Proper Shipping Name</th>
<th>Class</th>
<th>PG</th>
<th>Label</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US DOT</strong> <strong>TDG – Canada IMDG IATA/ICAO</strong></td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>Not regulated for transport.</td>
</tr>
</tbody>
</table>

**Emergency Response Guidebook (2008 ERG)**
Not applicable

**Environmentally Hazardous Substances**
None known

15. REGULATORY INFORMATION

Regulatory Lists / Inventories: The components are subject to the following regulatory lists and inventories:

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAA</th>
<th>CERCLA</th>
<th>IARC</th>
<th>US STATE RIGHT-TO-KNOW LISTS</th>
<th>CA PROP 65</th>
<th>SARA</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA, disodium salt</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
<tr>
<td>Water</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
<td>N/R</td>
</tr>
</tbody>
</table>

National Chemical Inventories Status:

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>US TSCA</th>
<th>Canada</th>
<th>EU EINECS</th>
<th>Australia AICS</th>
<th>New Zealand NZIoC</th>
<th>Japan ENCS</th>
<th>Korea KECI</th>
<th>Philippines PICCS</th>
<th>China IECSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDTA, disodium salt</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Water</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
15. REGULATORY INFORMATION (CONTINUED)

Legend

AICS  Australian Inventory of Chemical Substances
CA LIST California – Directors List of Hazardous Substances
CA PROP 65 California Proposition 65
CAA Clean Air Act, Section 112
CECRLA CERCLA Hazardous Substances
DSL Domestic Substances List – Canada
EINECS European Inventory of Existing Commercial Chemical Substances
ENCS Japan Existing and New Chemical Substances
FL LIST Florida – Substance List
IARC International Agency for Research on Cancer – Carcinogens – Groups 1, 2A or 2B
IECSC China – Inventory of Existing Chemical Substances
IL LIST Illinois Toxic Substances Disclosure to Employees Act
KECI Korea Existing Chemicals Inventory
LA LIST Louisiana Right-to-Know Reporting List
MA LIST Massachusetts – R-T-K Substance List
MN LIST Minnesota – Hazardous Substance List
NDSL Non-Domestic Substances List – Canada
NJ R-T-K New Jersey – R-T-K Hazard List
N/R Non Regulated
NZIoC New Zealand Inventory of Chemicals
PA LIST Pennsylvania Hazardous Substance List
PICCS Philippines Inventory of Chemicals and Chemical Substances
RI LIST Rhode Island – Hazardous Substance List
SARA SARA Title III, Section 302 / 313
TSCA Toxic Substances Control Act – USA
X Listed and/or Regulated

CANADA – WHMIS (Workplace Hazardous Materials Information System)

Not controlled
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and
the MSDS contains all the information required by the CPR.

Other Regulatory Information
The Cosmetic Ingredient Review (CIR) Expert Panel determined that EDTA and its salts are
safe as used in cosmetic formulations.

16. OTHER INFORMATION

HMIS RATING
Health: 1 / Flammability: 1 / Physical Hazard: 0 / Other: none
[ 0 – Minimal / 1 – Slight / 2 – Moderate / 3 – High / 4 – Extreme / * - Chronic Health Hazard (see Section 11)]

Trademark
Dissolvine® is a registered trademark of Akzo Nobel Chemicals B.V.

Date of Issue / Revision
November 24, 2008

Revision #
10.0

Changes
Section 16 / Logo

Prepared by
AkzoNobel [Technology & Engineering, SHERA - Regulatory Toxicology]
Tel. 613.273.8095

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products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the
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